SURREBUTTAL TESTIMONY OF JAMES W. STEGEMAN

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

DOCKET NUMBER 2003-326-C

MARCH 31, 2004

Section 1. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS AFFILIATION.

A. My name is James W. Stegeman. I am the President of CostQuest Associates, Inc. I am testifying on behalf of BellSouth Telecommunications ("BellSouth", "BST" or the "Company").

Q. ARE YOU THE SAME JAMES W. STEGEMAN THAT FILED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes. In my direct testimony I described the BACE model used for evaluations of economic impairment.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. I respond to the rebuttal testimony of Dr. Mark Bryant and Mr. James Webber (MCI), Mr. Don Wood and Mr. John Klick (AT&T) and Dr. Robert Loube testifying on behalf of the Staff of the Public Service Commission of South

Carolina. Each of these witnesses addresses the BACE model in their rebuttal testimony. My surrebuttal is confined to issues related to the operations and methods of the BACE model itself, Drs. Aron and Billingsley will primarily respond to issues relating to BACE model inputs and interpretation of the results.

Q. HOW IS YOUR SURREBUTTAL TESTIMONY ORGANIZED?

A. I have divided my surrebuttal testimony into six sections:

1) Introduction.
2) The BACE model is open to review, structurally sound, and is a valid TRO potential deployment tool.
3) The rebuttal by CLECs concerning BACE is inconsistent and contradictory.
4) Clarification of BACE features and misinterpretations of BACE.
5) Additional Rebuttal of Mr. Wood.
6) BACE is clearly superior to AT&T's model in meeting the requirements of the TRO and criteria discussed by Mr. Wood.

Section 2. THE BACE MODEL IS OPEN TO REVIEW, STRUCTURALLY SOUND, AND IS A VALID TRO POTENTIAL DEPLOYMENT TOOL

Q. HAVE ANY WITNESSES CLAIMED THAT BACE IS NOT OPEN TO REVIEW?

A. Yes, Mr. Wood (rebuttal page 24, lines 12-14), Dr. Bryant (rebuttal page 29, lines

5-9), and Mr. Klick (rebuttal page 6, section heading II) claim that BACE is not sufficiently open to allow a full review and analysis of the model. Staff witness Dr. Loube also makes certain claims regarding the openness of the BACE model.

Q. DO YOU AGREE WITH THESE PARTIES' ASSESSMENT OF THE OPENNESS OF BACE?

A. No. BACE and the supporting material provided with BACE will allow even a casual user to review the model. Indeed, BACE and the supporting material provided with BACE will allow any seasoned, telecommunications modeler the ability to review the inputs, review the logic, review the calculations, and verify the output.

Q. PLEASE DESCRIBE HOW PARTIES CAN REVIEW THE BACE MODEL.

A. My direct testimony included several capabilities to aid the user in evaluating BACE, including:

1. A detailed Users Guide (Exhibit JWS-2);
2. A detailed Methods Manual (Exhibit JWS-3);
3. A data dictionary and table layout (contained within the Methods Manual); and ,
4. Printable, BACE calculation logic source code for BACE version 2.2 (Exhibit JWS-4).

Q. WHAT OTHER MEANS TO EVALUATE BACE HAVE BEEN PROVIDED TO PARTIES?

A. There are several.

1) BellSouth offers, at no charge, BACE model support, by telephone and email.

2) I was a key presenter at public workshops on the model at the November 2003 NARUC meetings.

3) I presented information on the model at public workshop sponsored by the South Carolina Commission on November 6th, 2003, the Kentucky Commission on December 3rd, 2003, the Florida Commission on December 4, 2003, and at other venues in the BellSouth territory. Many of the CLECs that are actively participating in this docket attended one or more of these workshops.

4) Through counsel, parties were provided with access to BACE before my direct testimony was filed and without the need for a formal discovery request. Specifically, the link to the CostQuest website was forwarded electronically to AT&T on November 27, 2003 and to MCI on December 2, 2003. This version of BACE was substantively the same as the version of BACE filed with my direct testimony.

5) The majority of inputs (all non-proprietary inputs) are user adjustable so that changes can be made to test impacts and sensitivities; and various scenarios can be run either through the wizard or by modifying inputs and creating scenarios directly.

Q. HAVE YOU TAKEN ANY OTHER STEPS TO PROVIDE FULL ACCESS TO BACE?

A. Yes, I have. With my direct testimony I filed a version of the BACE model in which there is a linked database file (the file name is "Scenario"_Intermediate.MDB which resides in the "Scenario" folder) that allows the user to view non-sensitive intermediate processing tables for scenarios based upon the proprietary BellSouth customer data.

The BACE source code (for BACE version 2.0) was first provided to the parties in the Florida proceeding on December 23, 2003.

In Florida discovery, on January 22, 2004 BellSouth filed supplemental responses to Staff's Third Set of Interrogatories, which responses included PDF versions of the proprietary BACE tables for all nine BellSouth states, including South Carolina. MCI, and AT&T received copies of these responses, which contain information that applies regionally in the context of the state TRO proceedings.

In Florida discovery, on January 23, 2004, BellSouth filed supplemental responses to Sprint's First Request for Production of Documents, which included a BACE Demonstration scenario ("Demo") that is fully open for review by any party and which MCI and AT&T received copies of. The processed Demo scenario (including all input and processed BACE tables) is also fully accessible. It is intended to allow a user to see how the model processes from input data to intermediate processing tables to final values. (The price and customer demand

"data" in the BACE Demo is for illustrative purposes only and should not be interpreted or construed to reflect values for any particular geographic area. However, the user controlled input data in the BACE Demo is representative of the inputs filed by BellSouth).

With the above mentioned material, the user can review the structure of the system, all tables (input and processed), and follow the processing of the model much in the same way as I (and my team) have in developing, testing and refining BACE. And, all of these resources were available more than six weeks prior (and some were available more than three months prior) to the filing date of rebuttal testimony in South Carolina. Yet, Mr. Klick, Dr. Bryant and Mr. Wood still claim that their access to the model has been impeded in some way.

Finally, at the request of a party to the proceedings in Florida (the party is not involved in the South Carolina proceedings), BellSouth has made the complete editable source code of the BACE model available for review by all parties at its offices upon request. But to date, MCI, AT&T and their witnesses, have not availed themselves of the access provided by BellSouth. In short, claims that the BACE model is not sufficiently "open" are simply not credible.

Staff witness Dr. Loube, on the other hand, has availed himself of this access (as I explain later in my testimony).

Q. ARE THERE ANY OTHER AVENUES FOR A USER TO RECEIVE SUPPORT REGARDING BACE?

A. Yes. I am available to answer questions. In fact, staff witness Dr. Loube and parties from other state proceedings (other than AT&T & MCI) have called me and my team repeatedly as they worked through the code and the tables. This is not the case for AT&T and MCI (and their witnesses) here in South Carolina and in other BellSouth states. In my opinion, it is easier and more productive to address an issue or question in an open manner rather than making accusations in testimony.

Q. YOU HAVE FILED THE DEMONSTRATION SCENARIO. CAN THIS BE USED TO VERIFY THE SYSTEM?

A. Yes. In creating systems, developers recognize that a test dataset (designed to test various conditions within the model) is an invaluable and well known approach in testing complex models and the formulas / algorithms within. As such, we released the Demonstration scenario to allow others to test BACE in the same manner as it has been tested by me and my team. That is, the user can run the system, follow the processing, verify each formula / algorithm, and be reassured that the full "production" model will produce reliable results.

Q. THE DEMONSTRATION SCENARIO PROVIDED TO THE CLECS IN DISCOVERY IN FLORIDA DOES NOT HAVE ACTUAL PRICE AND CUSTOMER DEMAND DATA (NO ACTUAL DATA SPECIFIC TO ANY

STATE). WHY ARE CERTAIN TABLES AND INTERMEDIATE RESULTS STILL LOCKED FROM THE USERS' VIEW IN THE FULL BACE MODEL WITH ACTUAL DATA?

A. BACE, unlike the AT&T Model (which contains no revenue information and no South Carolina-specific product demand and customer counts), uses a proprietary database containing commercially sensitive and valuable information. Naturally, this data has to be protected. My objective in developing BACE was to make the model as open and easy to use, review, and evaluate, while still protecting this granular, sensitive and powerful data. Certainly, with the additional filed material (filed in my direct and rebuttal testimony and in responses to discovery), BACE users have more than adequate opportunities to use, review and evaluate the model.

Q. WITHIN THE FILED BELLSOUTH SCENARIO, ARE THERE INPUTS THAT CANNOT BE MODIFIED BY THE USER IN BACE?

A. The user cannot modify the initial input values for market prices and quantities. These "locked" quantities include both the total number of BellSouth customers and the number of each product category sold. However, the user has the ability to control modeled CLEC prices via the CLEC price discount and the bundle price inputs. These additional tables were created specifically to allow the user to control a la carte and bundle prices. The user also can control the CLEC quantities via the CLEC market penetration inputs.

Q. WHY CAN'T THE USER DIRECTLY VIEW (AS MR. KLICK WOULD PREFER) AND MODIFY THE UNDERLYING MARKET PRICE AND QUANTITY INPUTS?

A. The underlying market price and quantity information is BellSouth customer proprietary data and commercially sensitive. It is not possible to protect this proprietary information and still allow the user to change it. As a result, I designed BACE to provide the user the ability to create CLEC prices and quantities without adjusting the underlying data. The TRO requirement for granularity implies the need to examine a modeling trade-off between allowing the user to change every possible input and having a model that uses this granular, proprietary data. The clearly superior choice is to use proprietary data and provide other methods for the user to obtain modeled CLEC prices and quantities.

Q. DO YOU HAVE ANY ADDITIONAL RESPONSE TO MR. WOOD'S AND MR. KLICK'S SUGGESTIONS THAT EDITABLE SOURCE CODE IS REQUIRED FOR A REVIEW OF A MODEL?

A. Yes. Mr. Wood's claim (rebuttal page 4, lines 10-12) and Mr. Klick's claim (rebuttal section II) that editable source code is required to review BACE is misleading for several reasons. First, as the primary designer, debugger, and developer of the code, I do not have the editable version of the source code (and have never had it). I have a word processor document (similar to a PDF) that I use to analyze the code in conjunction with the ability to review the intermediate tables.

Second, in contrast to what Mr. Klick implies, editable source code for all key components of telecommunications models typically have not been provided to parties in a format allowing the user to make code changes or even to review. For example, the FCC's HCPM, and AT&T's sponsored HAI and original Hatfield models, which rely on customer data developed by PNR/TNS Telecom, have never provided editable source code for the development of the key customer data to parties. Parties were permitted to visit a PNR/TNS site and use the PNR/TNS computers to review the intermediate outputs of their processes. However, parties were not allowed to review the code. In addition, any parties making such a visit were precluded from copying anything, leaving with any material, and were charged a fee by PNR/TNS for the use of computers.

Similarly, consider the telecommunications model BCPM. This was a joint project of BellSouth, Sprint and USWest. It was written in Excel, VBA and C++. While the Excel and VBA programming were available to users, only a Word® document of the C++ code (which created the clustered customer data) was provided to parties.

Third, the non-Excel source code for the BSTLM, a model that was used by the Commission in recent BellSouth UNE proceedings, was released in PDF form, i.e., in the same format that BACE source code was provided to the other parties in this proceeding.

Fourth, contrary to Mr. Klick's statements and as noted previously in this surrebuttal testimony, the BACE calculation source code is available, printable and readable, and all BACE files have been opened so that any party can review the BACE model. To my knowledge, neither Mr. Klick, nor Mr. Wood, nor Dr. Bryant has ever asked for additional access to the BACE source code nor have they availed themselves to all that has been made available.

Q. IN REGARD TO BSTLM, MR. KLICK (REBUTTAL PAGES 16-17) CITES YOUR TESTIMONY IN GEORGIA REGARDING THE USE OF MICROSOFT EXCEL IN THE MODEL. WHY DID YOU NOT USE MICROSOFT EXCEL IN DEVELOPING BACE?

A. I did use Excel in BACE. (Microsoft Excel is used in BACE for the development of the retirement rates through the use of CapCost.XLS Excel workbook that resides in the BACE root directory.) However, the use of Excel in BACE development was limited. As a developer, I have to look at deploying an application for each unique situation that meets multiple, sometimes conflicting, criteria. These criteria can include: handling of complex calculations and data interactions, processing of large datasets, use of proprietary data, quick run times, deployable to parties in a proceeding, open and reviewable code, etc. While Microsoft Excel is a useful tool, it is not the best tool for every application (otherwise there would be no need for applications to be built in Visual Basic, Microsoft Access, C++, SAS, Delphi, Oracle, etc…). In developing BSTLM, it was my opinion that the mixed use of Excel, VB, C++, Access and other tools would best meet the requirements of the application. For BACE, it was my

opinion that VB and Access would be the best tools to meet the majority of the requirements (including openness and reviewability). There was no plot to hide anything, as envisioned by Mr. Klick. Rather, it was the result of a rational review of the requirements.

Further, it is interesting that Mr. Klick compares the openness of BACE to BSTLM. BSTLM included significant code development in Visual Basic and Access. And, the review of that code by outside parties was facilitated using PDF code files that referenced Access table and field names (similar to BACE). In fact, parties from Mr. Klick's firm were involved in many of the state proceedings that reviewed BSTLM and apparently were able to review the PDF version of the source code, understand field names, and make recommendations for modifications.

Q. EVEN THOUGH THE COMPILABLE SOURCE CODE IS NOT REQUIRED TO REVIEW BACE, HAS BELLSOUTH MADE AN EDITABLE, COMPILABLE VERSION OF ALL SOURCE CODE AVAILABLE FOR PARTIES TO INVESTIGATE?

A. Yes. As mentioned above, in connection with the Florida proceeding, BellSouth has made available the editable BACE source code on a machine at BellSouth's offices. AT&T and MCI were parties to the Florida proceeding and were aware of the fact that BellSouth had made the editable BACE source code available. Not only does this computer contain the editable source code for the calculation engine, it contains all the input and processing tables in an open format (i.e.,

passwords are either removed or provided) and the source code for the User Interface executable file and Table Utility executable file. The last two source code files have no calculation functions, but are provided for completeness.

While parties are only able to use the code on site, they have full access to all BACE processing logic in an editable form that they can modify, compile, run and analyze the results. In addition, all tables within BACE, including proprietary data, have been left unprotected. BellSouth will make this computer available at other BellSouth offices for additional review, if requested (as it has by making it available at its Washington D.C. office for Dr. Loube's use for this proceeding). To date, only Dr. Loube has requested such access for this proceeding.

With the provision of this source code machine, the source code files, and all the BACE input and processing tables, the parties have at their disposal full and open access to BACE (even more than has been requested by most of the parties in this proceeding) which makes the issue of BACE openness moot in this proceeding.

I should note that even though full and open access to BACE has been made available by BellSouth, Mr. Klick, to the best of my knowledge, has not availed himself of this access to the BACE source code machine, which he claims to be so critical to validate its results. This is in spite of the fact that the BACE source code machine, which includes open access to all data, has been available at BellSouth's Washington D.C. office which is near Mr. Klick's business offices in Washington D.C.

Q. MR. KLICK CLAIMS (REBUTTAL FOOTNOTE 3, PAGE 12) THAT "IF THE CODE IS PRODUCED AS SPRINT REQUESTED [IN FLORIDA], WE INTEND TO USE IT…" PLEASE RESPOND TO THIS CLAIM.

A. First, it bears repeating that, to my knowledge, neither AT&T, nor Mr. Klick nor Dr. Bryant (nor other AT&T or MCI witness in this proceeding in South Carolina) has requested access to the editable version of the source code. Had they requested this access, they would have received this access just as Staff witness Dr. Loube received it when he asked for it. (Note that staff witness Dr. Loube requested, and received, access to the editable version of the BACE source code even though he only has involvement in South Carolina, while the other witnesses have been involved in multiple states, with multiple opportunities to request access.) If access to the source code in an editable version is so vital to AT&T's and MCI's review, I would expect that AT&T, MCI, and their consultants would have availed themselves of any avenue to the source code at any point in time from the time they first gained access to BACE in November of 2003 and the source code in December of 2003. It appears that it is better for AT&T and MCI to complain about access to the source code than to actually gain access to it.

In regard to Mr. Klick's reference to the Sprint request in Florida, I think it is useful to put the Florida source code request in perspective.

In late December 2003, I placed the PDF version of the BACE source code on the CostQuest website. I provided the proprietary password to access that website to BellSouth. My understanding was that both AT&T and Sprint had informally

requested the BACE source code and that website access would be provided so that the parties could review the source code. Additionally, with my direct testimony, I provided a printable, PDF copy of the source code for the version of BACE that was filed in this proceeding (Exhibit JWS-4).

In mid-January 2004, I received data requests from Sprint. These data requests included a request for the editable version of the BACE source code. To my knowledge, there was no comparable request from AT&T. Thereafter, on January 30, 2004, I understand that BellSouth offered to make an editable version of the BACE model available at a BellSouth location. I have learned that this offer was emphatically rejected by Sprint witnesses during a conference call between BellSouth, the Florida Commission staff, and Sprint. While I did not personally participate in the conference call, I was available in case my participation in the call was needed.

BellSouth reiterated its offer to make the editable version of the BACE source code available in early February 2004. I personally arranged for a computer with editable source code to be sent to BellSouth's Tallahassee office. The computer was delivered to Tallahassee and available on February 13, 2004.

It appears that it is better for Mr. Klick (and Mr. Wood and Dr. Bryant) to complain that they do not have access to an editable version of BACE than to request the access that has been available for sometime. Their complaints are analogous to customers sitting in a restaurant, with a full country breakfast placed before them on the table (sufficient to satisfy even the heartiest rational hunger),

complaining that they never received the Eggs Benedict when (after more careful scrutiny) the Eggs Benedict was on the menu all along and they simply never bothered to order it.

Q. MR. KLICK CLAIMS (REBUTTAL PAGE 13) THAT THE BACE SOURCE CODE PDF IS INCOMPLETE. IS HE CORRECT?

A. No. At page 13 Mr. Klick lists functions and subroutines that are referenced or called by the BACE source code but which have not been provided by BellSouth. These are housekeeping/interface functions or utility functions that do not affect the underlying calculations in BACE. To ask for these is a bit like asking Mr. Turner (AT&T) for the underlying source code for Excel to review how Excel works.

However, to ensure that that all parties have access to material that may be relevant (even though these functions are not relevant to the calculations in BACE), I have provided as exhibit JWS-6 and JWS-7 the source code for these functions. In addition, these routines are available on the BACE source code machine that BellSouth has made available.

Q. MR. KLICK CLAIMS (REBUTTAL PAGE 10, LINES 6-10) THAT "WITHOUT ACCESS TO THE SOURCE CODE IN A FORMAT THAT WOULD PERMIT IT TO BE MODIFIED AND RE-COMPILED IT IS IMPOSSIBLE FOR A PROGRAMMER TO FOLLOW THE FIELD

NAMES THAT ARE USED IN THE CALCULATIONS SHOWN IN THE ADOBE ACROBAT FILE, …" IS THIS TRUE?

A. Certainly not. While Mr. Klick may not be able to follow the field names or understand the BACE source code, this does not mean that a programmer could not perform these tasks (as he claims). First, as I stated earlier, I don't use (and didn't use) the editable version of the source code to develop and refine BACE. Second, in order to modify the code a programmer first has to understand the code, the tables it uses, and the field names it references. Mr. Klick seems to argue the opposite. He claims to need to modify the code to understand it and the field names it references. His claim is counter-intuitive. Having an editable re-compilable version of any program does nothing to help the user follow the code or the field names. This is a bit like claiming that one requires chalk and an eraser to follow a series of mathematical equations on a blackboard.

While it is theoretically possible that one might make a meaningful change to the BACE code without "following the field names" and understanding the code, it is only possible in the same way that it is theoretically possible to write sound testimony blindfolded at the keyboard.

Third, as I mentioned previously, the user has other tools to help evaluate the model in addition to the Adobe Acrobat file of the source code: the BACE demonstration scenario; the ability to change inputs via the wizard or user-determined scenarios; BACE telephone and email support, and access to an editable version of BACE is available to parties that requested it.

Fourth, if manipulation of the source code was genuinely what Mr. Klick needed to understand BACE, one would expect him to use all avenues available to access an editable version of the source code (which he did not).

Q. IN ADDITION TO AT&T'S FAILURE TO AVAIL ITSELF OF THE EDITABLE BACE SOURCE CODE, DOES ANYTHING ELSE APPEAR DISINGENUOUS ABOUT AT&T'S DISCUSSION OF LIMITATIONS TO THE ANALYSIS OF BACE?

A. Yes. First, Mr. Wood does not cite a single South Carolina BACE result.

Second, it appears that Mr. Klick formulated his opinions regarding BACE before he ever attempted to run the model. It is noteworthy that his rebuttal testimony filed in South Carolina is substantially similar (in the first 30 pages) to that first filed in North Carolina on February 16, 2003. In his South Carolina rebuttal he added (South Carolina rebuttal page 50, lines 6-7): "[u]ndertaking sensitivity studies is an important initial step in seeking to understand how a model works …" However, when Mr. Klick filed his substantially similar North Carolina rebuttal testimony, on February 16, 2003, he did not file a single BACE result, and he had apparently not run the BACE model, or certainly he had not performed the "important initial step in seeking to understand how [BACE] works." Therefore, even without running BACE or taking this important initial step, Mr. Klick's opinions were apparently already formed.

Q. DR. BRYANT CLAIMS (REBUTTAL PAGE 41, LINE 17) HE HAS "ONLY A LIMITED AMOUNT OF TIME TO WORK WITH THE MODEL …" HAVE AT&T AND MCI HAD AMPLE OPPORTUNITIES TO REVIEW AND RUN BACE?

A. Yes. Representatives of AT&T and MCI attended a number of workshop presentations on the BACE model, mentioned above. Additionally as I noted earlier, the link to the CostQuest website was forwarded electronically to AT&T on November 27, 2003 and to MCI on December 2, 2003. AT&T and MCI were both parties to the Florida proceeding where they received a copy of the BACE model with Florida data on December 4, 2003. And finally, the BACE source code is available in PDF format, a demonstration scenario (including all with all input and processed BACE tables) is available, and the editable version of the model is available.

As I noted earlier, neither AT&T nor MCI requested an editable version of the BACE model, and neither has apparently availed itself of the opportunity to use the editable version of the BACE model.

Q. IS IT NECESSARY TO HAVE SOUTH CAROLINA-SPECIFIC INPUT DATA TO EVALUATE BACE AS A MODEL?

A. Certainly not. As I indicated earlier, any party could evaluate BACE as a model with the demonstration data, or data from another state (recall that BACE was formally filed in Florida originally on December 4, 2003). While the evaluation

of impairment in South Carolina obviously must rely upon a granular analysis of South Carolina data, the model itself can be reviewed with the data from another state (or the sample data in the BACE demo).

Q. MR. KLICK SUGGESTS (REBUTTAL PAGES 9-10) THAT MANY OF THE BACE TABLES ARE INACCESSIBLE TO THE USER. DO YOU AGREE?

A. No, quite the contrary. First, BACE contains a dynamic reporting engine that allows the user to obtain information from the processed scenarios from a summary level down to a granular analysis. The data available from the reporting engine includes all key results contained in the PMaster, QMaster, RMaster and CMaster BACE files. Second, as originally filed, 45 of 48 input Access Tables in BACE were open to any user. Of the three tables that are protected, PDF versions of the data have been made available to the parties through discovery in Florida. In addition to the PDF versions of the three tables, the user can control how these three protected tables are used via the use of the other 45 tables. Third, with the use of the Demonstration scenario or the source code machine at BellSouth's site, all tables are open for review.

Q. DR. LOUBE REPEATEDLY STATES THAT BACE RESULTS CANNOT BE EVALUATED BECAUSE SOME BACE FILES ARE NOT PROVIDED TO AN INDEPENDENT USER OF THE MODEL. IN ADDITION, ON PAGE 43, LINES 8-9, HE STATES THAT "…IT IS NOT POSSIBLE TO ACCEPT ANY RESULTS UNTIL ALL BACE MODEL INPUTS AND

OUTPUTS ARE PROVIDED TO ALL PARTIES." DO YOU AGREE THAT BACE CANNOT BE EVALUATED?

A. No. First, I would like to applaud Dr. Loube's effort to use all avenues available to review BACE. He is the only party to this proceeding that requested access to BellSouth's BACE source code machine, and he was provided access to that machine at BellSouth's offices in Washington, D.C. As a result of that access, Dr. Loube called my team and me repeatedly with questions, and we responded to all such questions in an accurate and timely manner. Dr. Loube's analysis in his rebuttal testimony is laid out in an organized manner and the outputs can (for the most part) be replicated by other parties.

However, I am confused why Dr. Loube suggests that the input and output files of BACE were not available. As I have discussed above, BACE is open to review and evaluation through a number of avenues (of which Dr. Loube has apparently availed himself of most, if not all of these options). For example, the user can access the following: the demonstration scenario to verify how BACE operates; PDF versions of the BellSouth customer proprietary data which have been made available; and, the BACE source code machine is available to use to review all inputs, outputs, and source code of BACE. All parties have can have equal access to these review options.

Q. DR. LOUBE SUGGESTS THAT CURIOUS RESULTS COULD NOT BE EVALUATED WITH WHAT HAS BEEN PROVIDED. PLEASE COMMENT.

A. First, I assume by these comments, Dr. Loube refers to an "an independent user of the model" that has not requested access to editable versions of the source code (which Dr. Loube has).

Second, I was able to use BACE's dynamic reporting engine (without need for source code, source code machines, or access to proprietary data) to investigate the results of Dr. Loube's runs and determine rational explanations for the results. (I will cover the results of my analysis later in this testimony.) Suffice it to say, BACE is a complex tool with many interrelated components. Yet, when a reviewer of the model uses the tools provided, the user can investigate and understand the values produced by BACE.

Q. MR. KLICK (REBUTTAL PAGE 16) CITES TWO (OF TEN) OF THE FCC'S UNIVERSAL SERVICE COST MODEL REQUIREMENTS. DOES BACE SATISFY THESE TWO REQUIREMENTS?

A. Yes it does, even though BACE is not a universal service cost model and these criteria, to the best of my knowledge, have not been noted as a requirement of impairment models by the FCC. As I described above, BACE is open to review and evaluation. In addition, during my deposition in Florida (which Mr. Klick cites in his rebuttal testimony on pages 59 and 60) I explained how BACE met the FCC's universal service criteria number eight (deposition transcript, page 102-3).

In addition, BACE satisfies the FCC's requirement number nine. The user has the ability to modify the critical assumptions and engineering principles such as the cost of capital, depreciation rates, fill factors, input costs, overhead adjustments, retail costs, etc.

Q. MR. KLICK CLAIMS (REBUTTAL PAGE 5, LINES 12-13) THAT HE HAS FOUND ERRORS IN BACE AND PRODUCED COUNTER-INTUITIVE RESULTS FROM BACE, WHILE MR. WOOD (REBUTTAL PAGE 4, LINE 10 AND PAGE 7, LINES 8-10) SUGGESTS THAT BACE IS STRUCTURALLY LIMITED AND PRODUCES INCONSISTENT RESULTS. WHAT IS YOUR RESPONSE?

A. While some of the parties have identified what they may believe are unusual results (which I will describe later in my testimony), there is nothing in the testimony of Mr. Klick, Mr. Webber, Mr. Wood, Dr. Loube or Dr. Bryant that indicates anyone has identified any significant errors in the model output, model platform or model operations. Outside of misunderstandings of the operations of BACE and misunderstandings of the allocations of indirect costs and corporate taxes across geographic areas within BACE, the majority of the issues that have been raised in regard to BACE and its output are related to input values not BACE algorithms. Indeed, Dr. Bryant states (rebuttal, page 34, lines 8-10).: **"…** I do not disagree with the general approach to estimating CLEC profitability outlined in Dr. Aron's and Mr. Stegeman's testimony."

In addition, BellSouth posed the interrogatory question to AT&T in Florida: "Do you contend that there are any errors or flaws in the BACE model? AT&T responded: "AT&T has made no such contention." (AT&T's Response to BellSouth's Sixth Set of Interrogatories, Interrogatory 240, dated January 16, 2004).

Q. MR. WOOD CLAIMS (PAGE 7, LINES 7-10 OF HIS REBUTTAL) THE MODEL IS NOT STABLE AND DOES NOT PRODUCE CONSISTENT RESULTS? IS THIS CLAIM TRUE?

A. Not at all. I will focus specifically upon Mr. Wood in more detail later in this testimony. However, Mr. Wood's accusation is unsupported and unjustified.

Q. DID YOU MAKE ANY MODIFICATIONS TO BACE IN ANY FILINGS HERE IN SOUTH CAROLINA?

A. No, not in South Carolina; by the time I filed the BACE model in South Carolina, with my direct testimony, the corrections had already been completed. However, in other jurisdictions I have made changes to ensure that BACE was the best tool for assessing economic impairment. I remain committed to submitting the best possible model to the Commission. This means that any substantive modifications will be made, if necessary, to present the most accurate version of BACE and to provide the Commission, and the parties to the proceeding, the best tool to evaluate economic impairment.

Q. WHEN YOU MADE CORRECTIONS TO BACE IN THE PAST, DID THE CHANGES TEND TO WORK ONLY IN "FAVOR" OF BELLSOUTH?

A. No. The errors discovered and corrected in BACE and its input data have not gone in the direction that would support BellSouth's claim of non-impairment. For example, the most recent update to data used in the proceedings in Alabama, Florida, Georgia, North Carolina and Tennessee increased the transport costs that are reported and thereby reduced the NPV values in all markets. Similarly, the initial transport values that would have been used in BACE (prior to the filing of direct testimony in South Carolina) would have lead to higher NPV values (had they not been corrected prior to the filing of BACE).

As the model developer I have a responsibility to produce an economic evaluation tool that is sound and satisfies the TRO. As I stated earlier, I remain committed to submitting the best possible model to the Commission.

Q. DESPITE CRITICISMS, HAVE OTHER WITNESSES USED BACE TO SUPPORT THEIR POSITIONS?

A. Yes. While some of the reviewers claim that BACE is flawed, the reviewers do not seem to have a problem in using the model, with inputs of their choice, to support their own positions. For example, Mr. Wood claims (rebuttal page 4, line 13) albeit without providing any information (e.g., BACE results) by which to assess either type of claim: "it is impossible in many cases to populate the model with meaningful input values" and (rebuttal page 24, lines 12-16): "I have not

been able to determine whether the model calculations are accurate … renders the results unreliable." Yet on page 21, lines 20 and 21 he states: "When inputs and assumptions are used that do reflect such reasonable judgment, the results of the BACE indicate that a rational CLEC …." and at page 10, line 8: "As BellSouth's BACE model can be used to demonstrate . . . ." (emphasis added).

It appears that Mr. Wood populated the model with (what he considers to be) meaningful inputs and the results were reliable (unless he is indicating that his inputs and results are not meaningful or reliable). Alternatively, he has concluded, albeit in a circular fashion, that the only reliable and meaningful inputs are those that show impairment in every wire center in South Carolina. In either case, his approach appears self-serving.

Q. MR. KLICK CITES THE TESTIMONY OF SPRINT WITNESS KENT DICKERSON IN FLORIDA (KLICK REBUTTAL, FOOTNOTE 2). DO YOU HAVE ANY COMMENT?

A. While I am not an attorney and I am not offering a legal opinion in this regard I do have a comment. While Mr. Klick may feel compelled to rely upon the testimony of others in other jurisdictions, Sprint is not a party in this proceeding and Mr. Dickerson (unlike myself) will not be available for cross examination here in South Carolina.

Should the Commission decide to consider the testimony of Mr. Dickerson, I would expect that the Commission would also consider the surrebuttal testimony I

filed in Florida as well as the surrebuttal testimony of Drs. Aron and Billingsley filed in Florida.

Q. ARE THERE ANY OTHER AREAS OF BACE MISUNDERSTANDING EXHIBITED BY MR. KLICK?

A. Yes. At times, it appears that Mr. Klick confuses the BACE model with issues regarding the choice of BACE inputs. For example, Mr. Klick cites (rebuttal page 51, line 11) "Mr. Stegeman's results", however I do not sponsor results in my direct testimony, I only sponsored the BACE model, its documentation, and materials useful for evaluation of the model. Mr. Klick claims "BellSouth's BACE model assumes that the CLECs will not serve geographic areas that are not profitable" (rebuttal page 46, lines 2-3). This is incorrect. Here he has confused user adjustable optimization inputs with the BACE model itself.

Section 3. THE REBUTTAL BY CLECS CONCERNING BACE IS INCONSISTENT AND CONTRADICTORY

Q. EARLIER YOU STATED THAT THE REBUTTAL TESTIMONY BY THE CLEC WITNESSES IS INCONSISTENT AND CONTRADICTORY REGARDING BACE. PLEASE EXPLAIN THIS STATEMENT.

A. There are four major areas of inconsistency and contradiction: 1) whether the fundamental BACE approach is reasonable; 2) whether BACE is sensitive or insensitive to changes in inputs; 3) whether BACE optimization should be

utilized; and, 4) which inputs are appropriate. I address the first three items in my testimony. With respect to inputs, these will be addressed in the testimony of other BellSouth witnesses such as Drs. Aron and Billingsley.

Q. WHAT INCONSISTENCIES EXIST IN THE CLEC WITNESSES' TESTIMONY REGARDING THE FUNDAMENTAL APPROACH UTILIZED BY BACE?

A. Mr. Wood makes vague and unsubstantiated claims about the appropriateness of BACE. For example, he states: "[t]he structural limitations of the model cannot be corrected …" (Wood rebuttal, page 4, line 10) and "I have been able to determine that the model does not consider all barriers to entry, …" (Wood rebuttal page 24, lines 14-15).

In contrast, Dr. Bryant states in Florida, Georgia, North Carolina, and Tennessee: "… with one or two exceptions that I discuss below, I cannot fault the general approach outlined in Mr. Stegeman's testimony and in the model documentation, …" (e.g., Tennessee Bryant rebuttal, page 28, lines 2-4, February 27, 2004). And, in his rebuttal here in South Carolina "… I do not disagree with the general approach to estimating CLEC profitability outlined in Dr. Aron's and Mr. Stegeman's testimony." (South Carolina Bryant rebuttal, page 34, lines 8-10).

Q. WHAT INCONSISTENCIES EXIST IN DISCUSSIONS OF WHETHER BACE IS SENSITIVE OR INSENSITIVE TO CHANGES IN INPUTS?

A. Mr. Wood claims that even slight changes to key inputs yield drastically different results (Wood rebuttal, page 20, lines 15-18). And, Mr. Klick (rebuttal, page 45, lines 1-6) claims that a 5 percent market share, straight-line penetration of the market and a 1% per year decline in prices reduces NPV from $48.8 million to a negative $11.6 million. In contrast, Dr. Bryant appears to find the model's outputs to be insensitive to model inputs. (Bryant rebuttal, pages 30-31).

Q. IS IT POSSIBLE TO ASSESS MR. WOOD'S CLAIM THAT SLIGHT CHANGES TO INPUTS YIELD DRASTICALLY DIFFERENT RESULTS?

A. No. Like much of Mr. Wood's testimony regarding BACE, this is an unsubstantiated assertion. Unlike Dr. Bryant and Dr. Loube reviewing BACE, Mr. Wood does not cite or provide even a single numerical result from BACE. Moreover, as I noted earlier, Mr. Wood only suggests one input change with any specificity. That change is the suggested 5.1% annual price change (based on a review of long distance prices 1984-1993). Even in this case, he does not specify whether he would apply this change to the default input values (which already reflect price reductions below existing prices).

Q. DR. BRYANT APPEARS TO BELIEVE THAT BACE IS RELATIVELY INSENSITIVE TO INPUT CHANGES (REBUTTAL PAGES 29-31). IS THIS INCONSISTENT WITH HIS FINDINGS?

A. Dr. Bryant's suggestion that BACE is insensitive to input changes is inconsistent with his own reported findings and other portions of his testimony. First, it is

noteworthy that much of his discussion at page 30 line 8 through page 31 line 7 is based on the number of wire centers that change from positive to negative NPV, rather than focusing on the size of the change in NPV. Any binary measure (such as whether a wire center changes from positive to negative NPV) can hide a great deal of information as compared to a continuous variable (such as the total dollar amount of NPV). Indeed, I find it noteworthy that he does not provide any measure of actual NPV in Exhibit MTB-9.

Second, in exhibit MTB-11 his very first column (a) with six input changes shows every wire center with a negative NPV value. As a simple matter of logic, either BACE does respond to input changes, or the values Dr. Bryant has chosen for his sensitivity runs are unreasonably pessimistic by any measure of judgment. (Of course, it may be possible that both are true.)

Q. WHAT INCONSISTENCIES EXIST ACROSS THE PARTIES IN DISCUSSIONS OF WHETHER THE BACE OPTIMIZATION ROUTINES SHOULD BE UTILIZED?

A. Mr. Wood appears to believe that segmentation, optimization and cream skimming are to be abhorred and no amount of data could convince him that they do, or even could, exist (Wood rebuttal, pages 34-39). Mr. Wood claims that firms investing in switches "… will have the incentive to serve as many customers as possible as quickly as possible … will hardly be in the position to be selective about its customer base." (Wood rebuttal, page 37, line 21 to page 38, line 3)

On the other hand, Dr. Loube and Mr. Klick, in their sensitivity analyses, do not change the optimization inputs from the BellSouth recommended inputs apparently agreeing that these are reasonable. In addition, Dr. Loube, counter to Mr. Wood's cream-skimming argument, argues that the market share for the lowest residential quintile (Loube rebuttal page 26, lines 16 through page 27, line 1) should be set to 0 since the CLEC will not recover the cost of serving this group.

Finally, Dr. Bryant runs BACE with the optimization filters off (Bryant rebuttal page 33, line 8 and page 40, line 5), then later complains that he finds "pockets of unprofitability" (Bryant rebuttal page 33, line 15)

It appears the solution to Dr. Bryant's complaints is the continued use (rather than the abandonment) of a number of the optimization filters. More importantly, the power and (ease of use) of the BACE model allows Dr. Bryant, to consider (and describe in his rebuttal testimony) results at such a granular level of detail (e.g., NPV by customer type by wire center).

Section 4. <u>CLARIFICATION OF BACE FEATURES AND MISINTERPRETATIONS OF BACE</u>

Q. DR. BRYANT (REBUTTAL PAGE 32, LINES 15-17) CLAIMS THAT "A SECOND ASPECT OF THE PROBLEM LIES IN THE MARKET DEFINITION PROPOSED BY BELLSOUTH AND IN THE WAY THE

MODEL AGGREGATES RESULTS TO CONFORM TO THIS MARKET DEFINITION." PLEASE COMMENT.

A. There is no fundamental market constraint in BACE. First, note that BACE allows the user to choose different definitions of markets; the user is not tied to any particular market definition. Second, despite Dr. Bryant's claims, he provides in his own rebuttal testimony BACE values that are not aggregated at the level he claims to be a problem.

Third, Dr. Bryant's entire discussion of "pockets of unprofitability" (rebuttal page 33, line 15) conflicts with the FCC's TRO Errata. Errata item number 23 states: "in paragraph 519, we delete the fifth sentence and delete footnote 1586." The deleted sentence at paragraph 519 states: "State commissions must ensure that a facilities-based competitor could economically serve all customers in the market before finding no impairment." The fact that the FCC deleted this sentence in the Errata item number 23 indicates that the FCC clearly rejected the notion of having to serve all customers or customer groups in a market.

Q. MR. WOOD CLAIMS THAT BACE PRICE INPUTS DON'T REFLECT VARIATIONS IN RETAIL PRICES ACROSS THE STATE. IS HE CORRECT?

A. No. While the spend band (quintile in the case of retail customer's) average price/average revenue per user (ARPU) is determined at the state level, the number and the percentage of customers falling into each spend band (quintile for

residence for example) varies by wire center based on both the retail prices that actually exist in the wire center and the propensity of customers in the wire center to purchase services in each of the major service categories. Using this wire center specific customer count and the ARPU, an unbiased estimate of the revenue for a wire center is determined.

For example, if wire center A is in a low-priced rate center (i.e., customers facing low tariffed rates), it will tend (other things being equal) to have customers with actual spend characteristics that are below the state wide average and will therefore have a higher proportion of mass-market customers in the lower spend quintiles. If wire center B is in a high-priced rate center, its customer's actual spend levels are likely to be relatively high and they will tend to have a higher proportion of mass-market customers in the higher spend quintiles.

Q. DOES BACE ALLOCATE CUSTOMERS TO WIRE CENTERS?

A. No. Mr. Wood's claim (rebuttal page 39, line 20-24) that customers are "allocated" from the state level down to wire centers is incorrect. In North Carolina, Mr. Klick made a claim similar to Mr. Wood's (Klick North Carolina rebuttal page 14), that BACE uses "a mechanism that forces an equal number of customers of each class into each spend category in each wire center." While the actual spend information by individual customers is not retained from the original data source, actual customer spend information by wire center is used to determine the number of customers in each wire center that fall into each of the

customer spend categories. Customers with similar spend characteristics are treated similarly.

In South Carolina, Mr. Klick has now dropped the reference to wire centers in his rebuttal testimony (presumably because he knew it is wrong) but he retains some misleading and nonsensical language (rebuttal page 11, lines 3-5), claiming that: "… using a mechanism that, statewide, forces an equal number of customers of each class into each spend category …" This is also incorrect. At the state level, customers are not "forced" into any category. Actual spend information is used to determine the range of each residential customer spend quintile (terciles for business categories).

I would like to note that from the starting point of actual expenditures by wire center by customer group, the user can establish starting CLEC price discounts, changes in the discounts over time, starting bundle prices, and changes in bundle prices over time, penetration rates and the speed by which penetration is achieved.

Q. MR. WEBBER STATES (REBUTTAL PAGES 5) AS SECTION HEADING IV: "BELLSOUTH FAILS TO DEMONSTRATE THAT CLECS CAN USE EELS TO SUPPORT MASS MARKET UNE-L." CAN YOU CLARIFY HOW EELS WORKS WITHIN BACE AND COMMENT ON MR. WEBBER'S ASSERTION?

A. Yes. In regard to EELs, if the user specifies, the model will determine whether collocation or EELs will be used on a wire center by wire center basis. This

determination considers the difference in NPV between a full collocation approach and a full EELs approach at each wire center. Regardless of one's perspective regarding the use of EELs, Mr. Webber is incorrect since the user of the model is free to turn EELs completely off so that only collocation is used. It should be noted that in the BellSouth filed South Carolina BACE run, collocation (rather than EELs) is used in the great majority of locations.

Q. MR. KLICK STATES THAT ALLOCATING SOME OF THE FIXED COSTS WITHIN THE LATA TO BOTH BELLSOUTH AND TO OTHER ILECS WITHIN THE LATA "TENDS TO UNDERSTATE CLEC IMPAIRMENT". (REBUTTAL PAGE 48, LINE 10) PLEASE COMMENT.

A. This BACE assumption is actually relatively conservative. BACE only allocates these costs to non-rural ILECs (BACE implicitly assumes that there is no CLEC service to customers in rural ILEC areas). And for these other non-rural ILECs, this approach has the effect of assuming that the adjacent areas have a zero NPV; i.e., there is no opportunity for the adjacent areas to generate a positive NPV in addition to the BellSouth area. Finally, the impact of this allocation on the total NPV in BellSouth's sponsored BACE South Carolina run is only a reduction of less than 2% and does not impact the market's NPV sign (negative or positive). Thus, whether one agrees or disagrees with the approach, the impact in South Carolina is insignificant.

Q. DR. LOUBE CLAIMS TO IDENTIFY CURIOUS ANOMALIES; MR. KLICK SUGGESTS (REBUTTAL PAGE 3, LINES 14-15) THAT HE HAS

IDENTIFIED "A SERIES OF ANOMALOUS RESULTS"; AND DR. BRYANT CLAIMS HE HAS IDENTIFIED "OCCASIONAL ANOMALOUS RESULTS" (REBUTTAL PAGE 41, LINES 7-8). PLEASE COMMENT.

A. There are two categories of reasons why BACE results from two runs can have the appearance of being anomalous: 1) allocations of indirect costs; and 2) income tax liability allocations. For these categories, I provide below a clear explanation of how the results can be produced and why these results are intuitive or the result of anomalous user inputs.

Q. PLEASE DESCRIBE HOW ATTRIBUTION AND ALLOCATION OF COSTS CAN LEAD TO THE APPEARANCE OF COUNTER INTUITIVE RESULTS.

A. If the user changes input values that only affect mass market customers (e.g., an input related to DSL service, which is not offered to large business customers) the NPV values for enterprise operations can still change due to cost attribution and cost allocation. If input changes lead to lower NPV values for mass market customers and losses of these customers for some areas or markets, the enterprise customers in some areas may then have lower NPV as they must now bear a greater proportion of the higher level costs in some areas where mass market customers are no longer served. This is not a counter-intuitive or anomalous result, but rather a reflection of the allocation of indirect costs that the CLEC incurs.

Q. IS THIS THE REASON WHY MR. KLICK (REBUTTAL PAGE 58), AND DR. LOUBE (REBUTTAL PAGE 27) NOTE INSTANCES IN WHICH ENTERPRISE AFTER-TAX NPV FALLS WHEN THEY DID NOT EXPECT THIS TO OCCUR?

A. Yes. Both Dr. Loube and Mr. Klick cite examples where input changes for the mass market segment leads to loss of service to mass market customers. This of course, leads to a reallocation of indirect costs and tax liability, leading to the potential for lower after-tax NPV for enterprise customers. Indeed, Dr. Loube correctly notes: "[a] possible cause of these facts might be that certain switch and corporate overhead costs have shifted to the enterprise market because there are now fewer mass market customers."

Q. MR. KLICK (REBUTTAL PAGE 59) DISCUSSES THE RESULTS OF A ONE PERCENT DISCOUNT EACH YEAR ON PRODUCT AND BUNDLE PRICES BUT CLAIMS "THERE IS NO REASON TO EXPECT THAT THE NPV" REDUCTIONS WOULD BE SO DIFFERENT BETWEEN ENTERPRISE AND MASS MARKET SEGMENTS. PLEASE COMMENT.

A. Mr. Klick claims that "there is no reason to expect" such a differential, but he provides no rationale for his claim. Indeed, this claim seems to contradict his suggestions elsewhere that mass market customers tend to have lower margins. If the mass market segment has lower margin, then it is at least plausible that with

an NPV-reducing scenario that the mass market NPV might be hit harder (a greater percentage reduction in after-tax NPV) than enterprise customers.

Q AS A SECOND REASON FOR APPARENT ANOMALOUS RESULTS, YOU MENTIONED THAT TAX ALLOCATION MAY BE THE CAUSE. HOW CAN TAX ALLOCATION LEAD TO THE APPEARANCE OF COUNTER INTUITIVE RESULTS?

A. BACE was designed to model an efficient CLEC, a firm that attempts to serve customers profitability and avoids serving unprofitable customers and areas. However, if the user turns off many of the optimizations or provides inputs that lead to a negative NPV in total for the CLEC, the allocation of corporate taxes can produce results below the state level that appear to be counter intuitive.

It is important to note that in any situation where total post-tax NPV becomes negative, the allocation of taxes essentially becomes moot. This occurs either in situations of negative total pre-tax NPV, or where pre-tax total NPV is positive, but smaller than the tax liability.

Q. PLEASE EXPLAIN HOW CORPORATE INCOME TAXES ARE TREATED IN THE BACE MODEL.

A. First, it is important to note that the BACE after-tax and pre-tax NPV calculations reflect the cost of equity. Unlike the cost of debt (or other cost items), the cost of equity is not a tax-deductible expense. Therefore, if a BACE run (a hypothetical

run) were to reflect a zero NPV for a state, this would imply a significant accounting profit for the modeled CLEC and a significant corporate income tax liability, in order to generate after-tax profits sufficient to compensate shareholders for the cost of equity. There will also be a range of results in which a negative total after-tax NPV will correspond to an accounting profit and a corporate tax liability. Indeed, even with some range of negative total pre-tax NPV, the CLEC would still generate an accounting profit and a corporate tax liability (since the pre-tax NPV already includes the cost of equity, i.e., it already reflects the required accounting profit to satisfy shareholders).

BACE was designed to identify and quantify the likely costs and revenues that a CLEC would incur and obtain in a UNE-L environment. BACE calculates corporate income taxes and provides a reasonable method of allocating taxes to products and smaller geographic areas when the modeled CLEC has a total NPV that is positive. However, BACE's allocation of taxes below the state level is not foolproof for modeling an NPV negative CLEC.

Q. HOW ARE INCOME TAXES ALLOCATED TO PRODUCTS AND GEOGRAPHIC AREAS IN BACE?

A. BACE uses pre-tax NPV to allocate corporate income taxes. A ratio of total tax liability to total pre-tax NPV is used to allocate taxes to those products and geographic areas that generate a positive pre-tax NPV.

Q. WHAT HAPPENS WHEN A USER MODELS A CLEC THAT HAS AN OVERALL NEGATIVE NPV?

A. When a user models a CLEC in which the tax liability is greater than the pre-tax NPV, the post-tax results can appear counter intuitive. This is because more than a dollar of taxes is allocated to each dollar of pre-tax NPV (and more than a dollar of tax credit is allocated to each dollar of negative pre-tax NPV) causing NPV values to flip-flop from positive to negative (for positive pre-tax NPV) and negative to positive (for negative pre-tax NPV), when comparing pre and post-tax NPVs. (Counter intuitive results can also obviously occur if the pre-tax NPV in total is negative.) While the allocation of taxes in BACE can be adjusted in situations where the post-tax NPV is negative, I am not sure what benefit it provides since the CLEC in total has a negative NPV.

Q. MR. KLICK CITES (REBUTTAL PAGES 59-60) YOUR DEPOSITION IN FLORIDA REGARDING TAXES. DOES MR. KLICK CITE THE EXHIBIT REQUESTED BY THE FLORIDA STAFF EXPLAINING THE TAX ISSUE?

A. No, Mr. Klick does not mention the exhibit which was the culmination of the entire deposition discussion on tax allocation. Therefore, I have attached the exhibit requested by the Florida staff on BACE tax allocation, as Exhibit JWS-8 in this proceeding. This exhibit provides a description and numerical examples explaining the tax allocation issue.

Q. DO YOU HAVE ANY ADVICE FOR THE BACE USER SEEKING TO MODEL A CLEC THAT HAS A TOTAL NPV THAT IS NEGATIVE?

A. Yes. First, I am not sure I see the value in analyzing market results for a CLEC that in total has a negative NPV. (Of course, other parties may see value in creating peculiar scenarios in which BACE has the appearance of counter intuitive results). However, should a user wish to carefully consider instances in which total after tax NPV is negative, the user should focus on the pre-tax NPV values. As I noted earlier, the tax allocation mechanism in BACE was designed for scenarios where the CLEC had a positive NPV.

Q. MR. KLICK CLAIMS (REBUTTAL PAGES 59-60) THAT THERE IS A TAX CALCULATION ERROR IN BACE THAT YOU CHOSE NOT TO FIX. IS THERE A TAX CALCULATION ERROR IN BACE?

A. No, there is not a tax calculation error in BACE. As I describe above, the issue is a design issue of choosing a method by which to allocate total corporate income taxes (which are already calculated) to products and geographic areas within South Carolina. As with any cost allocation issue, at times, the results can appear anomalous. As a design issue, I chose a corporate tax allocation method that provides reasonable results when there is positive total NPV. When there is negative total NPV, the issue of the allocation of the corporate tax liability to products or geographic entities within South Carolina is moot.

Q. MR. STEGEMAN, I THOUGHT THAT BACE ELIMINATED NEGATIVE MARGIN MARKETS IF OPTIMIZATION IS USED. IF THIS IS THE CASE, HOW CAN A USER END UP WITH NEGATIVE AFTER-TAX NPV RESULTS?

A. First, the optimizations within BACE are performed based on direct NPV. What I mean by this is that BACE compares the present value of the revenues to the present value of the direct costs for the optimization step at hand. What a positive margin (direct NPV) then indicates is that the item is producing a contribution to a higher level cost, that is, a cost that is not direct to the items we are looking at and will not go away should we eliminate the item we are considering. For example, the getting started investment of the switch is driven by the fact that the CLEC has customers within a LATA. Should a wire center within the LATA be eliminated, the getting started investment will not go away but would rather be re-apportioned to other wire centers that have positive margin (direct NPVs).

Therefore, what BACE retains are optimization areas that cover their direct costs, but not necessarily all of their apportionment of higher level costs that would only be re-apportioned (not eliminated if the area were dropped). Therefore, if a market has a direct NPV greater than zero, but a negative total NPV after the allocation of indirect costs, BACE still serves the market since it has an overall positive contribution to the CLEC. It is my understanding that Dr. Aron eliminates these negative NPV markets, thereby using a more conservative test for whether a market is impaired than the construct in BACE optimization.

Q. EARLER YOU STATED THAT YOU WERE ABLE TO EXPLAIN SOME OF THE "CURIOUS" RESULTS THAT DR. LOUBE OBTAINED IN A NUMBER OF HIS SCENARIOS. CAN YOU PROVIDE THOSE EXPLANATIONS HERE?

A. Yes. As noted above, BACE can produce negative after-tax NPV values for markets that still make economic sense (NPV covers the direct costs but not the indirect cost and tax allocations). This same phenomenon can occur at the product level within markets. That is, products can also show a negative after-tax NPV within a market but provide margin to help cover the indirect costs and tax liability of the CLEC. For instance, DSL is a BACE optimized product offering. In optimizing, BACE looks at whether the present value of the direct costs are less than the present value of the revenues to determine if the product should be offered. In certain instances, like the Augusta-Aiken GA-SC Zone1 market, the NPV of DSL after indirect costs are apportioned is negative. Thus, while it is rational for the firm to offer DSL in this market if service is provided in the market, after full allocation of indirect costs and taxes, the product can show a negative NPV.

In Dr. Loube's scenario runs (e.g., Scenarios 3, 5, 7 and 8), the impact of his change causes the optimization routine in BACE to turn off the DSL product offering in this market. This occurs because the present value of the direct costs of DSL exceeds the present value of the revenue of DSL. Before his changes, the total NPV of DSL in the market was negative (albeit producing a margin to contribute to the recovery of the indirect costs and tax liability). With DSL turned

off, the indirect costs of DSL are no longer apportioned to Augusta-Aiken GA-SC Zone1. Instead, these DSL indirect costs are now allocated to other markets. Thus, with the elimination of the apportioned indirect costs, the Augusta-Aiken GA-SC Zone 1 overall Mass Market NPV improves.

Q. HAS MR. KLICK MADE ERRORS IN REPORTING THE RESULTS OF HIS SENSITIVITY RUNS?

A. Yes. Mr. Klick has errors in the "Percent Change" columns in his exhibits JCK-2, JCK-3, JCK-4, JCK-5, JCK-6, JCK-7, JCK-8 and JCK-9. For example, on page 1 of exhibit JCK-3 for Columbia Zone 3 he shows a decrease in after-tax mass market NPV from a negative $36,158 to negative $236,225 as an increase in mass market after-tax NPV of 553.5%; obviously this is a reduction, not an increase, in after-tax NPV.

Moreover, these errors exist in the testimony filed by Mr. Klick in other states. As I have pointed out these errors in several other states, it would appear that Mr. Klick has chosen not to correct these misleading errors in his exhibits which could have been solved with any one of a number of simple methods in Excel. This is not the kind of repeated error that one would expect from someone implying that they would "evaluate, test and modify the complex calculation, 'optimization,' and 'filtering' portions of the BACE model" by changing the BACE code and recompiling the model (Klick rebuttal, page 3, lines 2-3).

Q. IF YOU CORRECT THE ERRORS IN MR. KLICK'S EXHIBITS, ARE MANY OF HIS CLAIMS OF "COUNTER INTUITIVE" OR "ANOMALOUS" RESULTS BASED ON HIS EVALUATION OF THE DETAILS OF NEGATIVE TOTAL AFTER-TAX NPV SCENARIOS?

A. Yes. Mr. Klick, in many instances, focuses on the details (below the total state level) of scenarios he has created that yield negative total after-tax NPV. As I described above, the BACE indirect cost and tax allocation mechanisms were designed to provide reasonable allocations when the total after-tax NPV is positive. When the total after-tax NPV is negative, no further analysis below the state level of geography is necessary.

Mr. Klick has negative total after-tax NPV scenarios in his exhibits JCK-2, JCK-6 and JCK-8, and his two tables both labeled JCK-6 (at pages 54 and 55 of his rebuttal).

In these scenarios, the total-state after-tax NPV declines as Mr. Klick would seem to expect. However, as I noted above, because these scenarios have negative total-state after-tax NPVs, indirect cost and tax allocations lead to the appearance of counter intuitive or anomalous results below the state level (for markets, wire centers or other measure of market segment). This suggests nothing regarding a possible error in the BACE model.

If for some reason a BACE user wishes to examine BACE results below the total state level when the total state after-tax NPV is negative, they should examine before-tax NPV values (which avoids the issue of tax allocation).

Q. CAN YOU EXPLAIN WHY MR. KLICK'S TABLE JCK-6, JCK-6, AND EXHIBIT JCK-6 APPEAR TO CONTAIN ANOMALOUS RESULTS (AS HE CLAIMS ON PAGES 53-55 OF HIS REBUTTAL TESTIMONY)?

A. No, not with certainty, because I was unable to replicate Mr. Klick's JCK-6 tables. (Note: to be clear, the above reference to tables JCK-6 and JCK-6 is not a typo on my part; Mr. Klick has two tables with the same name on pages 54 and 55). Additionally, Mr. Klick claims (rebuttal page 53, lines 9-10) that "in BellSouth's direct evidence, the net present value of the mass market is $15.7, and the net present value of the enterprise market is $41.9 million." These values do not match the values Mr. Klick shows in his Exhibit JCK-2, Exhibit JCK-3, Exhibit JCK-4, Exhibit JCK-5, Exhibit JCK-6, Exhibit JCK-7, Exhibit JCK-8, nor Exhibit JCK-9. This discrepancy, in combination with my inability to reproduce Mr. Klick's results, suggests that he may have made other changes which he did not describe in his testimony.

However, to the extent that Mr. Klick has modeled a scenario (or scenarios) with total negative after-tax NPV, his examination of results below the state level could reveal, as I discussed above, the appearance of anomalous results due to the allocation of indirect costs and tax liability

Q. PLEASE EXPLAIN WHY DR. BRYANT'S EXHIBIT MTB-11 APPEARS TO CONTAIN ANOMALOUS RESULTS (AS HE CLAIMS AT PAGE 41 OF HIS REBUTTAL TESTIMONY).

A. I have been unable to replicate the values for any of the columns in Dr. Bryant's Exhibit MTB-11. I expect that rather than an error in BACE, these results more likely reflect an inconsistency in Dr. Bryant's use of the model (e.g., he may have made additional changes not listed in his table, or he failed to make some of the changes listed in his table) or the fact that the firm he has modeled has negative NPV in total which can lead to tax allocation issues as I mentioned above. However, if the firm has a total negative NPV (in part caused by the user turning off all forms of optimization) there is no sense in analyzing the results at any level below the state.

In addition, his analysis appears to have an obvious error. He reports that 140 wire centers have a negative NPV. However, when one counts the number of wire centers listed in Exhibit MTB-11, there appear to be only 118 wire centers. Either he has a typo in the total count or he has not provided a full and complete listing of the wire centers. I believe it is the former and that there are only approximately 118 wire centers in BellSouth's South Carolina operating area.

Q. MR. KLICK DESCRIBES (REBUTTAL PAGES 56-58) A BACE RUN IN WHICH ALL PRODUCTS (INCLUDING LOCAL SERVICE) IN A BUNDLE RECEIVE A DISCOUNT (EXHIBIT JCK-8). IS THERE AN ERROR IN BACE RELATED TO BUNDLE PRICE DISCOUNTS?

A. No. However, Mr. Klick chose a bundle discount configuration that I did not expect a user to choose. Indeed, Mr. Klick discusses elsewhere in his testimony his finding that basic local exchange service has low or negative NPV values for some customers, yet here he chooses to discount this service. Within BACE when all products included within a bundle are tagged as being discounted, all bundle prices drop out of the model due to a SQL join condition. As a result, all bundle products show a price of 0. This is why all the mass market customers are removed in Mr. Klick's run (since Mr. Klick uses the same optimization filters that BellSouth recommends).

As a design and documentation issue, it may be better if the BACE model and/or the BACE documentation warned the user that at least one service of a bundle must be excluded from the discount (and perhaps suggesting that local service be excluded). Alternatively, BACE code changes could be applied to allow for the scenario Mr. Klick chose.

Q. MR. KLICK SEEMS TO SUGGEST (REBUTTAL PAGES 51-53) THAT RELATIVELY HIGH MARGINS FOR LONG DISTANCE SERVICE SOMEHOW REFLECTS AN ERROR IN BACE. PLEASE COMMENT.

A. This is one of the instances in which Mr. Klick has confused (or intentionally misrepresented) his disagreement regarding BACE inputs with the model itself. Product margins represent the difference between revenues and costs which are the result of <u>inputs</u> to BACE. If he truly doesn't understand the distinction

between the model and its inputs, he is unlikely to be able to meaningfully modify and recompile the code to the model in order to **"**evaluate, test and modify the complex calculation, 'optimization,' and 'filtering' portions of the BACE model" (Klick rebuttal, page 3, lines 2-3).

Q. MR. KLICK IMPLIES (REBUTTAL PAGES 55-56) THAT BACE MODEL LOGIC CONSTRAINS THE A LA CARTE PRICE DISCOUNT TO ONLY LINE SUBSCRIPTIONS, INSTALLATIONS AND REGULATORY CHANGES. HE IMPLIES THAT THIS REPRESENTS AN ERROR OR A SHORTCOMING IN BACE. IS HE CORRECT?

A. No, Mr. Klick is incorrect. The user controls how the a la carte discounts are applied. The model simply processes the user's inputs. As clearly described in the BACE documentation, bundles are priced and treated separately from a la carte services in BACE. The user can establish bundle prices and a la carte discounts. The a la carte discount is only applied to user specified a la carte prices, not to bundle prices (which are determined separately by the user).

Section 5. ADDITIONAL REBUTTAL OF MR. WOOD

Q. DOES MR. WOOD MAKE UNDOCUMENTED ASSERTIONS REGARDING BACE?

A. Yes. Mr. Wood makes a variety of claims and assertions regarding BACE. However, unlike other witnesses in this proceeding, he fails to provide a single numerical result from BACE, nor does he provide an exhibit with any BACE results. Such undocumented assertions provide no available information by which his assertions can be evaluated, and should be viewed with skepticism given the lack of foundation.

Q. DOES MR. WOOD CONFUSE SHORTCOMINGS OF A MODEL (BACE IN THIS CASE) WITH DISAGREEMENT REGARDING INPUT CHOICES?

A. Yes. At several points in his rebuttal testimony, Mr. Wood makes assertions regarding BACE, but only provides associated rhetoric related to the choice of the input values. For example, at page 40, lines 2-3, he states: "The BACE goes on to assign a different CLEC market share for the different customer spending segments …". The user of course determines CLEC market shares (BACE doesn't assign them) by segment (and the user can vary them over time if they choose). However, as I note elsewhere in my surrebuttal testimony, when Mr. Wood populates the model with unspecified inputs of his choosing it provides results he finds comport with his view of the world. This has nothing to do with a model shortcoming; Mr. Wood appears to be attempting to disguise some issue regarding inputs under his claims of model shortcomings.

Q. DOES MR. WOOD MAKE UNDOCUMENTED AND MISLEADING ASSERTIONS REGARDING CRASHES OF THE BACE MODEL?

A. Yes. At page 7, lines 7-8 of his rebuttal he asserts that he has not been able to complete his analysis of BACE, apparently in part since "[o]ur efforts continue to be encumbered by the frequent crashes of the model and the limitations of the model wizard." I have several responses.

First, Mr. Wood's comment is surprising in light of the fact that in operating BACE, I (and my team) and the LECG team have had no problems with crashes. I have determined that the model is stable, consistent, and operates as stated in the documentation.

Second, I am unaware of similar complaints from other parties. Given the number of runs documented by LECG, Sprint (in Georgia and Florida) and MCI in their testimony, the natural conclusion would be that problems with crashes in BACE would have been raised through these parties, had they occurred.

Third, emails and phone calls to the BACE model support team are illustrative. When an employee of Wood and Wood Consulting contacted BellSouth's BACE support manager in early December 2003, raising concerns with initial slow run times and log-in problems in running BACE, these concerns appeared to be caused because an attempt to run BACE in a shared-server environment. BACE was not designed to run in, nor was it tested for, a shared-server environment. These concerns appeared to be resolved by December 11, 2003 through the use of BACE on a stand-alone computer platform. Thereafter, BellSouth responded to additional questions from Wood and Wood consulting about how to perform runs

on the model from December 11-15, 2003. However, no concerns relating to frequent "crashes" were raised between December 11, 2003 (once the appropriate computer platform was used) and the filing of Mr. Wood's rebuttal testimony in Florida. Mr. Wood's Florida rebuttal testimony is virtually identical to the rebuttal testimony he filed in Georgia, North Carolina, Tennessee, Alabama and that which he filed here in South Carolina. I would expect that if Mr. Wood continued to be encumbered by frequent crashes, he would have contacted the BACE support team (there is no charge for the support).

Since Mr. Wood's identical rebuttal testimony was filed with the Florida Commission on January 7, 2004, more than nine weeks later, the statement that AT&T's "efforts continue to be encumbered by frequent crashes …" (emphasis added) is misleading. On January 15, 2004, after Mr. Wood's rebuttal testimony was filed in Florida, a concern relating to crashes was communicated to BellSouth. The timing of this "concern", in light of Mr. Wood's other unsubstantiated claims, seems somewhat questionable. I am unaware of any additional (after January 15, 2004) complaints or problems that Mr. Wood is having with "crashes" of the model.

Q. MR. WOOD ALSO COMPLAINS THAT LIMITATIONS OF THE BACE MODEL WIZARD HAVE ENCUMBERED HIS EVALUATION OF BACE (WOOD REBUTTAL PAGE 7, LINE 8). IS THIS A VALID COMPLAINT?

A. Certainly not, for at least three reasons. First, the user has the option to either use the BACE wizard, or create and run scenarios outside the wizard. Second, other

models (e.g. HCPM, BCPM) either do not have a wizard, or do not have an extensive wizard. Third, the BACE model wizard is designed for ease of use, especially for those without the skill or time to examine the all of the model's inputs in great detail. Anyone genuinely seeking to evaluate a model, and having the skills to even initially evaluate a model, should not need to rely only on a model wizard alone. For example, any party suggesting that they need the source code to a model should not need to rely upon the model wizard for evaluation. Claiming that the limitations of a model wizard creates an encumbrance to review is akin to an auto mechanic claiming that a car needs more gauges and lights by the steering wheel in order to readily evaluate the engine; popping the hood is still an option if you are actually a mechanic.

Q. MR. WOOD STATES (REBUTTAL, PAGE 23, LINES 18-19) THAT "…BACE HAS NO PLACE TO ENTER A PROJECT BETA…" IS IT NECESSARY TO INPUT A PROJECT BETA IN ORDER TO CALCULATE ECONOMIC IMPAIRMENT?

A. No. From a modeling perspective, BACE provides input values for the pre-tax cost of capital, the cost of equity, federal and state tax rates and the proportion of equity. Nothing more is required to determine the cost of capital used in BACE. As Dr. Billingsley has described, beta is fully reflected in these values, so there is no further role for beta to play. To the best of my knowledge, no other telecommunications cost model (e.g., BCPM, HCPM, HAI, BSTLM) allows for the specific input of a project beta. Indeed, it appears that AT&T's cost disadvantage model does not allow the input of a beta.

Q. MR. WOOD ASSERTS (REBUTTAL PAGE 28, LINES 14-15) THAT IT IS IMPOSSIBLE TO ACCURATELY DETERMINE THE REVENUES THAT A CLEC IS LIKELY TO RECEIVE WITHOUT THE ABILITY TO INPUT FUTURE PRICE CHANGES BY WIRE CENTER. DO YOU AGREE?

A. No, for several reasons. First, as I discussed above, BACE already leverages a powerful database that reflects actual prices and actual spend levels by wire center. Therefore, the starting market prices and customer expenditures are specific to the wire center and customer segment.

Second, BACE allows the user to determine CLEC price discounts by customer segment, by market, over time (if the user wishes). BACE also allows the user to establish bundle prices by customer segment by market and changes in bundle prices over time. Further, BACE allows the user to determine CLEC penetration by customer segment over time. In designing BACE, there seemed to be no need to forecast prices changes on a wire center basis.

Third, it is unreasonable to expect a user would be willing to perform the task of inputting even initial prices by wire center, let alone forecast future prices by wire center. BellSouth has a large number of wire centers in its service area in South Carolina each with 17 customer-spend categories in BACE. Each of these would have approximately 15 services, each requiring data (under Mr. Wood's approach) for 10 years; this leads to over 300,000 price data entries.

Fourth, Mr. Wood's claim that wire-center level price forecasts are necessary is at odds with AT&T's model which provides no price information, nor ability to input price forecasts of any kind.

Fifth, Mr. Wood's claim that wire-center level price forecasts are necessary is at odds with his prior claim (rebuttal page 7, line 8) that he and his team are encumbered by the limitations of the BACE wizard. Recall that Mr. Wood is also the only party to complain about the limitations of the wizard. Logic suggests that Mr. Wood should be the last party to attempt the daunting and unnecessary task of forecasting prices by wire center

Q. MR. WOOD CLAIMS "THE [BACE] USER HAS NO ABILITY TO CONSIDER A SHORTER INVESTMENT HORIZON [THAN 10 YEARS] THAT A RATIONAL INVESTOR WOULD CONSIDER BEFORE MAKING AN INVESTMENT IN A LARGE, FIXED ASSET SUCH AS A LOCAL CIRCUIT SWITCH." DR. LOUBE (REBUTTAL PAGES 19-20) RAISES A SIMILAR CONCERN. WHAT IS YOUR REACTION?

A. First, these statements are at odds with the time horizon of AT&T's cost disadvantage model. Mr. Turner indicates (direct, page 26, footnote 23) that AT&T's analysis uses a 10-year study period.

Second, my team has examined the inputs to the model, both the Input Portfolio attached to Turner's testimony and the software itself, and there does not appear

to be any mechanism to change the study period. We can only assume that the overall study period of AT&T's model is fixed at ten years.

Third, other models use a 10-year period or a longer period for the evaluation of economic impairment. The NRRI model (the pre-cursor of Dr. Bryant's model) used asset lives to determine impairment analysis through a TELRIC type costing approach. As such, the time horizon for the costs of assets ranges from 6-30 years. The switch life was ten years. In looking at other industry models, the SPR model submitted in other states actually uses a 25-year time horizon for cash flows.

Fourth, in is my understanding that AT&T and MCI have consistently advocated the use of FCC depreciation lives in cost proceedings. My understanding is that the prescribed FCC depreciation lives applicable to BellSouth range from 8 to 30 years, depending on the type of equipment and the low and high ranges. Moreover, Mr. Turner employed a 13-year switch life input in the AT&T model filed in Florida. However, in his rebuttal testimony, Mr. Wood implies that a switch needs to be recovered in some period less than ten years. Certainly, a 10-year study period is conservative for assets with lives longer than ten years.

Fifth, Dr. Loube's reference to the FCC's separations process is not relevant to the TRO's requirements for a business case analysis. With levelized costs for an existing and ongoing enterprise a three-year period may be sufficient for the FCC's separations purposes. However, ten years is appropriate for a cash flow NPV-based model designed to satisfy the TRO.

Section 6. <u>BACE IS CLEARLY SUPERIOR TO AT&T'S MODEL IN MEETING THE REQUIREMENTS OF THE TRO AND CRITERIA DISCUSSED BY MR. WOOD</u>.

Q. ISN'T AT&T THE SAME PARTY THAT SPONSORED A MODEL THAT MR. WOOD CLAIMED IS RELEVANT FOR THIS PROCEEDING?

A. Yes, and Mr. Wood mentions Mr. Turner's results (Wood rebuttal page 16).

Q. GIVEN THE MODEL REQUIREMENTS IMPLIED BY THE TRO, AND THE MODEL CRITERIA DISCUSSED BY MR. WOOD, HOW DOES BACE COMPARE WITH THE AT&T MODEL?

A. BACE is clearly superior.

Q. MR. WOOD (REBUTTAL PAGE 31, LINES 16-17) CLAIMS THAT BACE FAILS TO MEET THE BASIC REQUIREMENTS FOR AN IMPAIRMENT MODEL THAT YOU SPECIFY IN YOUR DIRECT TESTIMONY. PLEASE COMPARE AND CONTRAST BELLSOUTH'S BACE MODEL WITH AT&T'S MODEL.

A. In my direct testimony I discussed at length (pages 8-18) the characteristics that must exist for a model to be consistent with the TRO. Below I provide a table

with the four major categories of characteristics, comparing how BACE and AT&T's model meet the four required characteristics.

Characteristic	**BACE**	**AT&T model**
1) Capable of granular analysis	yes	yes as to cost, no as to revenue
2) Consistent with efficient CLEC business model & architecture	yes	no
3) Incorporate all likely CLEC revenues and costs	yes	no
4) Perform a business case analysis using NPV	yes	no

Q. PLEASE EXPLAIN THE ENTRIES IN THE TABLE ABOVE.

A. In my direct testimony I described in detail how the BACE model meets these four major characteristics. Thus, I will briefly describe the entries for the AT&T model only. First, in regard to "Capable of granular analysis," while the AT&T model considers some cost information at the wire center level, its level of granularity is not sufficient for this proceeding since it is does not consider key information on all CLEC cost components. In addition, the AT&T model has no information at a gross or granular level regarding revenues. Having a model that is capable of granular analysis for only a subset of the information needed to assess economic impairment is simply not useful. This is analogous to needing detailed loop costs but only having the granularity in the feeder portion of the

loop; it simply doesn't provide sufficient information to meet the needs of the Commission in this proceeding.

Second, concerning "Consistent with efficient CLEC business model & architecture," the AT&T model does not provide for optimization in CLEC service offerings and engineering, does not consider all potential CLEC product offerings, and does not consider all potential customers (e.g., across multiple ILECs in a wire center). If a model does not consider the opportunities for a CLEC to optimize its business, it will tend to overstate CLEC costs and/or understate CLEC revenues; this could lead to an erroneous finding of impairment.

Third, regarding "Incorporate all likely CLEC revenues and costs," the AT&T model does not consider revenues at all, and it ignores certain CLEC costs. Thus, the AT&T model fails to provide any meaningful result; it only provides a cost /output picture that is, incomplete, and insufficient to satisfy the requirements of the TRO.

And fourth, concerning "Perform a business case analysis using NPV," while the AT&T model does appear to use some present value calculations, it does not perform a business case analysis. A net present value calculation reflects the present value of revenues net of the present value of costs; yet the AT&T model does not consider revenues nor does it consider all relevant costs. Because the AT&T model has no revenue information at all, it cannot provide an NPV calculation and cannot be utilized to measure economic impairment as established within the TRO.

Q. CAN YOU ELABORATE ON THE SECOND (OF THE FOUR MAJOR MODEL CHARACTERISTICS YOU LIST ABOVE), WHICH REFERS TO AN EFFICIENT CLEC BUSINESS MODEL AND DESCRIBE WHETHER BACE AND THE AT&T MODEL SATISFY THIS CHARACTERISTIC?

A. Yes. In order to satisfy the TROs requirements to reflect an efficient CLEC's activities, BACE allows the user to incorporate CLEC optimizing activities that could lead to either lower CLEC costs or greater opportunities for CLEC revenues. In the table below, I have identified some of the key dimensions over which a CLEC might optimize its network or its service offerings in order to be efficient, and whether each of the models allows optimization for that dimension of activity.

Dimension Over Which to Optimize	**BACE**	**AT&T model**
1) EELs or collocation	yes	no
2) DSL within the wire center	yes	no
3) Provide (or not provide) service in total for a wire center	yes	no
4) Provide (or not provide) service for Mass Market customers for a market	yes	no
5) Provide (or not provide) service for Enterprise customers for a market	yes	no
6) Provide (or not provide) CLEC service in total for a market	yes	no
7) Provide (or not provide) CLEC service in total for a LATA	yes	no
8) Place (or not place) a switch in each LATA	no	no

9) Place (or not place) a fiber ring	no	no

Q. WHAT IS THE IMPLICATION OF BOTH BACE AND THE AT&T MODEL NOT OPTIMIZING ON ITEMS 8 AND 9 IN THE TABLE ABOVE?

A. Any model that does not incorporate an opportunity for the CLEC to reduce costs or gain revenues, by not providing optimization in a dimension of CLEC activities, has the potential to overstate the CLEC's costs, or understate revenues. Such omissions therefore have the potential to overstate impairment, i.e. to indicate economic impairment when it does not actually exist. BACE is therefore conservative in these two dimensions and it may overstate CLEC costs. As a result, BACE may overstate economic impairment. The AT&T model is very conservative (it may overstate CLEC costs) since it does not optimize in any of the dimensions listed in the table above and further the AT&T model does not model any CLEC revenues.

Q. MR. WOOD CLAIMS (REBUTTAL PAGE 24, LINES 14-16) THAT BACE DOES NOT REFLECT ALL CLEC BARRIERS TO ENTRY. HOW DOES BACE COMPARE TO THE AT&T MODEL WITH RESPECT TO CAPTURING ALL CLEC COSTS?

A. Beginning at page 51 of my direct testimony, I list 15 cost items that are discussed in the TRO and I describe how these cost items are included in BACE. While

AT&T's model incorporates many of the 15 cost items, it does not incorporate the following (numbered in the same fashion as my original list of 15):

1) "Costs of purchasing and installing a switch" (TRO, ¶ 520);

2) "[T]he recurring and non-recurring charges paid to the incumbent LEC for loops" (e.g., TRO, ¶ 520, and n. 1588) (The AT&T model only considers the non-recurring costs);

5) "[T]he recurring and non-recurring charges paid to the incumbent LEC for … signaling" (TRO, paragraph 520); 9) "taking into consideration … the scale economies inherent to serving a wire center and the line density of the wire center," the AT&T model deploys various levels of equipment capacity and collocation space dependent upon the number of lines they expect to serve in each wire center. However, the model serves all wire centers regardless of the economics of serving all wire centers and therefore it fails to reflect an efficient CLEC (see the rebuttal testimony of Dr. Aron).

13) "taking into consideration … the cost of maintenance, operations" (TRO, ¶ 520); and 14); "taking into consideration … the cost of … other administrative activities" (TRO, ¶ 520). (Underlining in my original direct testimony.)

Q. MR. WOOD COMPLAINS (PAGES 25-29) ABOUT BACE'S TREATMENT OF REVENUES AND PRICES. PLEASE COMPARE AND CONTRAST BACE AND THE AT&T MODEL IN THESE DIMENSIONS.

A. In the table below I compare BACE & the AT&T model with respect to their treatment of prices and revenues in relation to the TRO requirements and the complaints by Mr. Wood.

Item	**BACE**	**AT&T**
Incorporates initial prices via a detailed database on revenues	yes	no
Incorporates geographic differences in the initial prices by wire center via variations in revenues by customer spend categories by wire center	yes	no
Number of major product categories	6	model has no revenue
Allows CLEC to introduce services over time	yes	no
Allows the use of initial CLEC price discount for a la carte services	yes	no
Considers the size of the total market in determining revenues	yes	no
Considers the effects of bundles of services	yes	no
Allows user to input price changes for a la carte prices	yes	no
Considers CLEC penetration in determining CLEC revenue	yes	no
Allows user to input price changes for bundle prices	yes	no
Allows changes in CLEC penetration over time and its affect on revenue	yes	no

Allows the user to vary price changes by service category (e.g., long distance)	yes	no
Provides a user with hundreds or thousands of pages of inputs to allow the user to establish prices by wire center	no	no
Allows the user to input different CLEC penetration rates by customer spend group	yes	no

Q. ARE THERE OTHER COMPARISONS BETWEEN THE MODELS THAT ARE RELEVANT BASED ON THE TRO AND MR. WOOD'S REBUTTAL TESTIMONY?

A. Yes. In the table below I list other comparisons that are relevant for the Commission in evaluating a model to assess economic impairment.

Item	**BACE**	**AT&T**
Number of years considered	10	10
Allows user to consider a terminal value of the business	yes	yes
Provides a model wizard	yes	no
Considers income taxes	yes	no
Considers calculations of net income	yes	no
Allows the user to enter a project beta	no, not necessary	no, not necessary
Allows for revenue and penetration trends	yes	no for revenue, allows demand

		trend for cost
Allows costs to change over time	yes	no
Sizes equipment to correspond to demand	yes	yes
Allows the user to size equipment for specific number of years	yes	no
Allows the user to consider the economies gained from serving two or more ILEC territories in a LATA	yes	no
Provides a bright line test for impairment	yes	no

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

BACE Interface Functions

Confidential and Proprietary Information

BACE Utility Functions

Confidential and Proprietary Information

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REQUEST: Please respond to the surrebuttal testimony of Sprint witness Dickerson at page 8, line 11 to page 11, line 6.

RESPONSE: At page 8, line 11, of Mr. Dickerson's surrebuttal testimony, he purports to attach Exhibits KWD-12, which he claims shows that BACE is illogical. His assertion is without merit.

Mr. Dickerson's exhibit KWD-12 shows the results of four different BACE runs, each with a negative total after-tax NPV (row 38) ranging from approximately -$33.4 million to -$120.4 million. Two of these scenarios even have a negative total pre-tax NPV (columns E and F). It appears is that in each of the runs, all but one of the user adjustable optimization toggles (all but the colo or EELs optimization) was turned off (see the rebuttal testimony of Dr. Staihr, page 17). Essentially, all of these runs represent Mr. Dickerson forcing the modeled CLEC to serve all areas (including those that are not economically profitable to serve). Therefore, he has modeled a total entity in Florida that is certainly not efficient and which is not economically profitable (i.e., it does not cover all of its costs including income taxes and the cost of equity).

Before discussing the BACE allocation of corporate income taxes, it is instructive to consider the full scope of the costs BACE considers. Unlike a standard P&L (profit and loss) statement, the BACE NPV metric of impairment includes not only the cost of the network, operations, taxes and debt interest, but also the cost of equity. Unlike the cost of debt (or other cost items), the cost of equity is not a tax-deductible expense. Therefore, if a BACE run (a hypothetical run) were to reflect a zero after-tax NPV for the state of Florida, this would imply a significant taxable income for the modeled CLEC and a significant corporate income tax liability, in order to generate after-tax profits just sufficient to compensate shareholders for the cost of equity.

There will also be a range of results in which a negative total after-tax NPV will correspond to a positive taxable income and a corporate tax liability. Indeed, even with some range of negative total pre-tax NPV, the CLEC would still generate a positive taxable income and a corporate tax liability (since the pre-tax NPV already includes the cost of equity).

Now consider how taxes are allocated within BACE. Corporate taxes represent a cost associated with the total operations of the CLEC. Corporate income tax

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forms are, of course, not filed for each product offered or for each geographic area served. Since corporate income taxes are caused by taxable income (i.e., taxable measures of revenue less tax deductible measures of cost), one form of tax allocation would track some approximation of taxable income. However, taxable income excludes the cost of equity (which is not a tax deductible expense). Therefore, allocating taxes on the basis of taxable income would require that BACE carry this alternate information on taxable income at each and every dimension of the data; a daunting task to say the least. However, the NPV value of every data dimension is available. Since NPV provides an approximation of the "profitability" of a dimension over time, it was selected as a reasonable approach to allocate the corporate taxes.

BACE was designed to allow a user to model an efficient CLEC, a firm that attempts to serve customers profitability and avoids serving unprofitable customers and areas. As such, BACE's allocation of corporate income taxes on the basis of pre-tax NPV as a ratio of (total PV tax)/(total pre-tax NPV) should produce a reasonable assignment of the tax costs for an efficient CLEC. This allocation works as follows.

Consider a hypothetical example in modeling an efficient firm. Total pretax NPV is $10,000,000 and the estimated present value of the taxes is -$7,000, 000 (and total after-tax NPV is $3,000,000). (Note that since taxes are a cost, they have a negative present value, i.e., higher taxes have a greater negative effect on NPV). The tax allocation formula in BACE is (total PV taxes)/(total pre-tax NPV). In this case the tax allocator is -0.7 and each positive pre-tax NPV dollar is reduced by $0.70 to reflect its tax liability. Similarly, each negative pre-tax NPV dollar is assigned a reduction in tax liability of $0.70 (i.e., the -0.7 is multiplied times a negative pre-tax NPV to produce a positive gain to that product or area's NPV or a reduction in its negative NPV by $0.70 on the dollar). In this case, both positive and negative pretax NPV values become smaller (closer to zero) as taxes are applied.

However, in any situation where total post-tax NPV becomes negative, the allocation of taxes essentially becomes moot. That is, if a firm in total has a negative NPV, there is little to be gained by investigating the tax implications on the markets it operates within since it is unlikely the firm would be operating at all. This occurs either in the situations of negative total pre-tax NPV (columns E & F in Mr. Dickerson's KWD-12), or where pre-tax total NPV is positive but smaller than the PV of the tax liability (columns D and G of KWD-12).

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Turning to the case of negative total pre-tax NPV identified in column E of KWD-12, Mr. Dickerson has turned off optimizations such that the resulting CLEC (which he forces to serve all areas) has a pre-tax NPV of approximately -$93.2 million. However, the CLEC still earns taxable income in total for some period of its existence sufficient to generate a PV of taxes of approximately -$27.1 million. In this case the resulting tax allocation ratio is approximately 0.29 (= -93.2/-27.1). Note that because of the negative NPV, the allocator has a positive sign, opposite of what one should expect, leading to counter intuitive results in the after-tax NPV calculations.

Now consider the case of a positive total pre-tax NPV in column D of KWD-12 of approximately $31.2 million. Again, since Mr. Dickerson has turned off optimization, the resulting CLEC (which he forces to serve all areas) has a PV of taxes of approximately -$64.7 million, which is greater in absolute value than the total pre-tax NPV. Here the tax allocator is -2.07. Here the sign is correct (negative) but the value is greater than one (in absolute value). Each dollar of positive pre-tax NPV is now assigned -2.07 PV in taxes, and each dollar of negative pre-tax NPV is allocated +2.07 PV in taxes (i.e., a reduction in tax liability). In this circumstance, the signs of after-tax segments or areas will tend to flip when after-tax NPV is calculated.

Certainly, these results do not "demonstrate the BACE Model NPV results to be fatally flawed and unsuitable for the conclusions asserted by BellSouth" as Mr. Dickerson claims at page 11 of his surrebuttal. BellSouth did not advance a model of inefficient CLEC behavior forcing the CLEC to serve economically unprofitable areas, leading to total negative after-tax NPV.

Nor do these results suggest that Mr. Dickerson cannot model (for whatever reason) the inefficient activities of CLEC serving all geographic areas. However, the BACE tax allocator and calculations of after-tax NPV were designed as a convenience for the user. If the user wishes to model inefficient CLEC behavior, then the user could focus on pre-tax values and ignore after-tax NPVs. While the allocation of taxes could be modified in the situation where the NPV of the CLEC is negative, such a modification would be nonsensical because it would negate the purpose of the model, which is to consider the activities of an efficient CLEC.